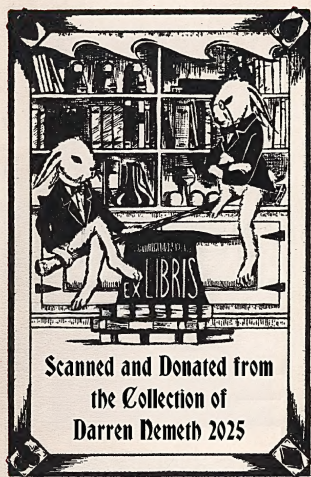


**SIMPLIFIED REVERSAL  
OF  
MOTION PICTURE  
FILM**



**Price 25c**

**SUPERIOR BULK FILM CO.  
105 South Wells Street  
Chicago 6, Ill.**



## INTRODUCTION

**T**HIS BOOKLET is dedicated to those countless thousands of amateur home movie enthusiasts whose interest in their chosen hobby reaches beyond the mere pressing of the exposure button.

You save money when you process your own films—you also get the thrill and pleasure of controlling the results. Film costs you less, for you can use bulk film and spool it yourself. You are able to take more pictures and enjoy your hobby at very little cost. Because good results are so easily secured, you should end up with a finer collection of pictures. Amateurs who process their own movies can take pictures and see them the same day—scenes may be remade at will and spliced into your pictures—and titles, including trick effects are easy to make.

Here, in simple, easy-to-understand language, we are going to tell you how to process your own motion picture film. All you need is a dark room and a few, readily obtainable supplies. Elaborate facilities are not necessary. The kitchen or bathroom of an ordinary apartment—your basement—or any small closet where running water is accessible serve as an adequate darkroom.

The methods and formulae outlined here for the reversal of motion picture film have been carefully tried and tested. Thousands of amateurs throughout the country are processing their own home movies with professional results. Of course, in the actual reversal of film, experience is the best guide. You are urged to work with short lengths of film at the start using small quantities of solution in jars. Keep accurate data on each strip until you get the "knack", and the experience so gained will enable you to quickly determine the best method to use for your particular handling of the film.



## BULK FILM

Without regard to why you are doing your own developing, a discussion of the types of film available and their uses is in order. The films used in home movies are of two major types—panchromatic and orthochromatic. Panchromatic film is so called because it is sensitive, to a more or less degree, to all of the colors of the spectrum. Orthochromatic film is sensitive to a smaller portion of the spectrum. SUPERIOR'S SUPERPANEX No. 24, No. 64 and No. 100 are fully panchromatic films. SUPERIOR'S REGULAR and PLUS films are orthochromatic.

For the beginner it is a good idea to start using orthochromatic film because he can more easily see what the processes are under a red safelight than under a green safelight. Also this film is priced more reasonably and the economy of using it for the first few times at least is apparent. More will be said about the advantages of the different types of film available and their uses farther along in the text.

## HANDLING OF THE FILM

Now let us start from the beginning and go over the process of the use of bulk films. First there is the winding of the bulk roll on the camera spool. It must be explained that the term "BULK FILM" means film that is not wound on a camera spool. Before it can be put into the camera for making the exposures it must be wound on a camera spool. Empty 25, 50 and 100 foot camera spools and Standard 50 foot 16mm Magazines are available thru Superior Bulk Film Co.

Winding bulk film is a simple procedure, which, depending on the kind of film you are using, must be done in the darkroom under a proper safelight. A Superior Bulk Film Winder is helpful as it accommodates any size spool and holds a master roll up to 400 feet of film. The film is wound on the camera spool

with the emulsion side down toward the core of the spool. The emulsion is the dull side of the film. When film is wound on the spool it is ready to be put in the camera for the exposure. Handle the film carefully and do not allow it to scrape on the ground and make every effort to handle it by the edge so as to avoid fingerprints on the film. Handling film along the edges is a good practice.

Orthochromatic film may be safely handled under a red safelight which gives plenty of illumination to work with ease. Panchromatic film must be handled under a green safelight or in total darkness.

It is usually not necessary to measure the film that goes on the spool because it is all used and developed by the movie maker. Just wind on all the film the spool will take, leaving enough space on the spool to add leaders if you want to load the film outside of the darkroom.

Just a word about daylight leaders. If you have a changing bag they are unnecessary but if you do not have a dark room handy and wish to change your film on the outside, it is a good idea to add some leader stock to each end of the film for protection from light. Leader stock is opaque film which is attached by splicing to the ends of the film. For 8 mm 3½ feet is usually adequate, and for 16 mm 100 ft. rolls, 5 feet is recommended. These leaders should be spliced onto the film in the dark room—a simple procedure with a little practice. Leader stock may be used over and over again.

## THE THEORY OF REVERSAL

Briefly, the entire reversal process consists of first developing out the exposed image in the negative, bleaching out that image and then exposing the undeveloped and unexposed silver by flashing, redeveloping and fixing to give the final positive image.



## FIRST DEVELOPER

Film is coated with an emulsion containing silver salt or silver halide which is sensitive to light. If properly exposed, the First Developer changes the silver halide upon which light has acted during exposure to metallic silver and gives a negative, similar to a still negative. It is upon correct first development that the success of reversal depends. Whether your film comes out of the Second Developer over or under developed is altogether dependent upon the time and temperature of the first development. Time and temperature is usually the important factor.

## BLEACHING

Bleaching is the heart of the reversal process. When the film comes out of the First Developer the image is in negative form because only the silver halide which has been directly affected by the light has changed into the metallic silver. If you should project the film at this stage everything would be in reverse of its actual appearance. A man who, when photographed, had been wearing a white shirt and dark trousers would appear to have a black shirt and white trousers. This is because the shirt, being white, affected the sensitive silver halide on the film, producing an invisible image which is turned to metallic silver during the first development—the trousers, being black, did not affect the sensitive silver halide at this stage. When placed in the Bleach Bath, the metallic silver is bleached out and the unexposed film, unaffected by the original exposure, remains. In other words the film is reversed. The unexposed and undeveloped silver halide is not affected by this process and remains to be converted into the positive image during the flashing or re-exposing and second development. Film coming out of the Bleach has only the latent image which is not generally visible to the eye and the film appears to be a creamy yellowish color.

## CLEARING BATH

The Clearing Solution is an important step in the reversal process because it eliminates a possibility of stain by the bleach. Properly cleared film will be cream color and have no trace of a yellowish brown stain.

## FLASHING — 2 KINDS FLASHING BY PHOTOFOLD

Flashing by Photoflood exposes the silver salts remaining in the emulsion, which were not affected in the original exposure and development, thereby completing the reversal process. (The outline of the dark trousers are now affected by light and will be reduced to metallic silver during the second development—the metallic silver of the white shirt has been removed in the Bleach.)

## SECOND DEVELOPMENT

During the Second Development the silver halide which has been exposed during the Flashing is converted to metallic silver and the positive image is formed.

## CHEMICAL FLASHING

Chemical Flash, an unselective developer, combines the Flashing process and the Second Developer in one operation. During this operation the surface of the film is completely and evenly flashed and the remaining silver becomes completely blackened.

## FIXING AND HARDENING

During the fixing stage any unused silver which may not have been taken out in the Bleach is removed and the gelatin is hardened and preserved. The fixing and hardening process also removes the anti-halation backing with which some film is coated. This completes the cycle of the reversal process and will give a working outline of what is taking place in each step, in the use of the various chemicals.



## WASHING

Because washing follows each step of the reversal process and because the success or failure of the developed roll depends much upon the thoroughness of the washing, it is necessary to go into it in detail, before reviewing the actual process of reversal development.

**WASHING MUST BE DONE THOROUGHLY AND AT THE SAME TEMPERATURE AS THE DEVELOPING SOLUTIONS.**

### WHY WASHING IS ESSENTIAL

Consider these important factors—the First Developer contains alkali solutions—the Bleach Bath contains Sulphuric Acid. If the alkali of the First Developer is not thoroughly washed from the film and is carried over into the Bleach Bath, the acid is neutralized by the alkali and the Bleaching Bath may be rendered inert. Further, the emulsion of the film, while in the First Developer, absorbs Sodium Carbonate. After completion of the First Development, unless thoroughly washed out, this Sodium Carbonate will be acted upon by the Sulphuric Acid in the Bleaching Bath. Carbon Dioxide gas will be given off and this gas passing through the emulsion will cause numerous pinholes. So wash, wash, and wash some more if you want good results. Running water, of course, is best, but it is not essential. If you plan to do your processing in the basement, a double laundry tub, well cleaned, is excellent. Wash first in one then in the other. If you plan to process in the kitchen, the kitchen sink will do—if in the bathroom, a bath tub or a large basin with a few changes will do the trick, or a spray with a low force is ideal. Empty your tubs and refill for the next washing as soon as one washing is complete. While the film is being washed, empty the first developing solution out of the tray into its proper container through a

funnel. When drum has been transferred to the second laundry tub, rinse developing tank or tray in the first one, or if other method of washing is used, run a spray or stream of water into tank or tray. Fill tank or tray with your next solution so that it is ready for the film when the washing has been completed.

## NECESSARY EQUIPMENT

Contrary to general belief, elaborate equipment which requires a great deal of space, is not necessary in order to successfully process motion picture film. All that is necessary in the way of apparatus is a developing and drying rack—a tank or tray to hold the solutions and washing facilities (tubs, sink or basin).

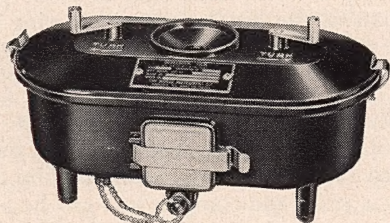
Most practical is the Superior Cine Reel—an open drum type developing reel which accommodates 110 feet of 16mm film or the Junior Home Processor which holds 30 feet of film. The developing reel is equipped with separators to prevent the film from overlapping during the processing. An adjustable take-up bar to take up any slack in the film when wet is built into the reel. The DeLuxe Cine Reel is a one piece unit which contains the developing reel, drying rack and tray. The tray has a drain for easy changing of solutions. Only one tray is required for all operations.

The drying rack is constructed to allow for contraction of the film when drying and fits into standards which support the rack while the film is drying. The unit is small and compact and can be assembled and taken apart with a minimum of effort. The tank is constructed to hold a gallon of solution and designed to accommodate the reel keeping the film immersed during the rotating process.



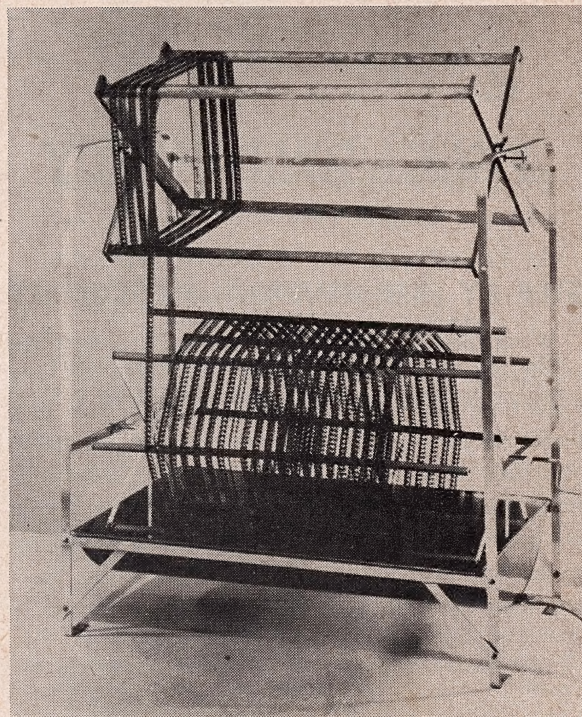
### MORSE G-3 DAYLIGHT TANK

The Morse G-3 Daylight Tank is a compact, speedy daylight developing unit for processing Double 8mm, 16mm or 35mm movie film for negative or reversal process (capacity 3 pints of solution). Film must be loaded into the tank in the dark, but all steps in processing may be carried on in full light. The developing tank and cover are built light-tight of acid-proof molded bakelite. The cover has a light-proof funnel opening at top to introduce processing solutions and water. Tank has drain at bottom, with attached drain plug to draw off solutions after use. The film reels are of stainless steel and accommodate up to 100 feet of film. Secondary exposure is made thru a glass viewing window in front of the tank. The window is water tight with a light-tight cover which can be opened at will, when you are ready for re-exposure. Agitation is automatically supplied by movement of the film through the solution when winding from one reel to the other. The drying rack does not accompany the tank but may be purchased separately.



Morse G-3 Daylight Tank . . . . . \$22.50  
Superior Drying Rack, 100 ft. capacity . . . . . \$5.95

### SUPERIOR DELUXE CINEREEL HOME PROCESSING OUTFIT



110 ft. Capacity — \$19.95  
Requires 1 gal. Solution



# PRELIMINARY

## STEP BY STEP REVERSAL PROCEDURE

Wind the film on the Developing Rack with the emulsion or dull side of the film away from the rack, toward the operator (otherwise you will have rack marks on the film). Remember to use a red, orthochromatic safelight if you are processing orthochromatic film—a green panchromatic safelight if you are processing panchromatic film. Check your bottles to see they are correctly labelled with heavy black crayon so you can see them in the dark.

### HINT

Before starting processing, it is a good practice to “dunk” a short length of exposed, but undeveloped film thru each of the solutions to determine if the solutions are acting properly or if they have become exhausted.

# STEP

# ONE

**FIRST DEVELOPMENT 3-5 MINUTES AT 68°**  
**For Orthochromatic Film (Regular and Plus)**

**FIRST DEVELOPMENT 5-7 MINUTES AT 68°**  
**For Panchromatic Film**  
**(Superpanex #24 and #64)**

**FIRST DEVELOPMENT 7-9 MINUTES AT 68°**  
**For Fast Panchromatic (Superpanex #100)**

If temperatures are warmer than 68 degrees, shorter developing times are required. If temperatures are colder, greater developing times will be required. Subtract one minute developing time for each 2 degrees over 68°.

You are now ready to change the exposed silver salts to metallic silver. Stir the developer and check the temperature before you start development. Remember to keep the developing solution as close to 68 degrees Fahrenheit as you can. Never get beyond 70 degrees. If your exposures were generally accurate, 3 to 5 minutes with the reel constantly revolving should be correct for orthochromatic film. Panchromatic film requires more developing time. First Development should be continued until film appears very black. (Do Not Forget that your red and green lights are very deceptive and make your film look much darker than it really is.)



# STEP TWO

**WASH FILM THOROUGHLY FOR FIVE MINUTES**

## **Be sure water is not too cold**

If you are using a double laundry tub, wash in one tub for 2 minutes then transfer to the other tub for 3 minutes rotating drum while washing. If you wash in a bath tub or a large basin, a few changes will do or a spray with a low force. Then empty your tubs and refill for the next washing. While the film is being washed, empty the first developing solution out of the tray or tank into its proper container. Rinse developing tank and fill tank with your next solution.

# STEP THREE

**BLEACH — 5-7 MINUTES**

**Remember to rotate drum**

*After Bleaching 3 minutes you may turn on a small white light for the remaining steps.*

Now you are Bleaching out the exposed metallic silver. Be sure all the metallic silver produced by the First Developer is removed. When using Superior 1-Solution Bleach it is not necessary to use Sulphuric Acid. The Acid is combined in the chemical and all that is needed is water. Be sure to watch that temperature—After bleaching for 3 minutes, turn on a small white light and continue to Bleach until the image is clearly Bleached out and the film looks perfectly blank—(clear creamy color). Upon careful observation you may see faintly an image on the film where the silver has been removed. Rotate the film in the solution during the Bleaching to insure proper and even action of the solution. Too long a bleach will result in a brownish stain on the film.



# STEP

## SIX

**WASH — 5 MINUTES**

Do a thorough job—don't hurry it—watch the temperature. Empty the Clearing solution into its container through a funnel into which you have stuffed cotton. This will strain the solution and keep it clean. Wash the tray—now you are ready for the Last Development.

# STEP

## SEVEN

### **FLASH AND SECOND DEVELOPMENT 7 MINUTES**

Now you are going to expose the silver salts remaining in the emulsion which were not affected in the original exposure thereby completing the reversal process—then you will convert the exposed silver halide to metallic silver and the positive image will be formed. Rotate the reel two or three times in the Second Developer—watch the temperature. Make sure film is thoroughly wet. Now turn on a No. 1 Photoflood light in a reflector at a distance of about 3 feet and rotate the reel in the developer while the light is shining on the film until the film becomes thoroughly and evenly dark all around. Turn off the photoflood and continue development for about 5 minutes or until you can see a good clear image.

### **OR STEP NO. 7 USING CHEMICAL FLASH**

If using Chemical Flash eliminate the flashing process and the 2nd Developer. Chemically flash one to five minutes. Chemical Flash is an unselective developer. During this operation the surface of the film becomes completely black and no flashing with a Photoflood is necessary. Chemical Flash must be prepared fresh immediately before using—its keeping qualities being limited. It should be discarded after being used.



# STEP

# EIGHT

**WASH — 5 MINUTES**

Yes, wash again—that's important. The water bath is as important as the chemical solutions.

# STEP

# NINE

**FIXER AND HARDENER — 10 MINUTES**

Now you are making sure all the unused silver has been taken out and at the same time you are hardening the gelatin on the film. Fix and harden for 10 minutes. You will notice the anti-halation backing is removed by the fixer. Be sure your temperature is correct. If your film has a black backing which is not removed in the fixer and hardener you will have to use Carbon Tetrachloride or Alcohol on it to remove this backing.



# STEP

# TEN

## WASH FOR 20 MINUTES

Wash in running water for about 20 minutes—be sure you do a thorough job because clean film projects with sparkle and brilliancy. After you are sure the film has been thoroughly washed, wind it on to the drying rack, emulsion side out, sponging it gently to remove the water spots as you wind. (Wet your chamois or sponge and run the film through it as you wind it on the drying rack. If the film, when it is reeled on your Drying Rack is attached with rubber bands at each end, it will compensate for shrinkage as it dries. Allow to dry in a dust free room.)

After final wash rinse film in a bath of water and a few drops of Kwik Wet (see directions on bottle). This will insure even and water spot free drying and eliminate the necessity of chamoising the film.

## WORKING OUTLINE OF REVERSAL PROCESS

1.	<b>FIRST DEVELOPER</b> 3-5 Minutes—68°—Orthochromatic, Regular or Plus 5-7 Minutes—68°—Panchromatic, Superpanex 24, and 64 7-9 Min.—68°—Hi-Speed Pan. Superpanex No. 100.
2.	<b>WASH 5 MINUTES</b>
3.	<b>BLEACH</b> 5-7 Minutes
4.	<b>WASH 5 MINUTES</b>
5.	<b>CLEAR</b> 5-7 Minutes
6.	<b>WASH 5 MINUTES</b>
7.	<b>FLASH AND SECOND DEVELOPMENT</b> Second Developer and Flash 3 to 4 turns in developer. Flash until film is evenly dark, turn out light and continue to develop 5 minutes.
7A	<b>CHEMICAL FLASH</b> Flash until evenly dark—Eliminate Second Developer.
8.	<b>WASH 5 MINUTES</b>
9.	<b>FIX</b> In hardened Acid Hypo 10 Minutes
10.	<b>WASH</b> Running water, 20 minutes
11.	<b>SPONGE AND DRY</b>



## DARK ROOM ACCESSORIES

- SUPERIOR CINE REEL DEVELOPING OUTFIT**—Includes drying rack .....\$19.95
- MORSE G-3 DAYLIGHT LOADING DEVELOPING TANK**—\$22.50. Drying rack extra .....\$5.95
- CINE CHEMICALS**—1/2 gallon, \$1.80—1 gallon, \$2.90  
Nothing needed but water.
- RED ORTHOCHROMATIC SAFELIGHT**—For handling Orthochromatic film, which is insensitive to red light .....95c
- GREEN PANCHROMATIC SAFELIGHT**—For handling medium speed Panchromatic film .....95c
- PHOTOGRAPHIC CHAMOIS OR SOFT VISCOSE SPONGE**—For sponging water from film before winding on drying rack—this prevents water spots from remaining on film .....55c
- THERMOMETER**—To make sure your temperatures remain constant during the developing period. A photographic thermometer with the 65-70 zone especially marked is most desirable .....57c
- THERMOMETER**—Stainless Steel—hook type tray thermometer .....95c
- #1 PHOTOFLOOD BULB**—For flashing film before 2nd Development .....30c
- QUART SIZE FUNNEL**—For pouring solutions back into containers .....65c
- GRADUATE OR MEASURING PITCHER**—For measuring water added to chemicals .....70c
- DARKROOM APRON**—For protecting clothing..\$1.50
- JUNIOR HOME PROCESSING OUTFIT**—Includes 30' capacity rack, tray and drying rack.....\$6.50
- HYP0-CHEK**—Signals when your hypo is exhausted .....35c

**KWIK-WET**—Super Concentrated wetting agent, prevents airbells, assures thorough fixation, insures even drying of film .....35c

## CHEMICALS

While formulae which can be mixed at home are included herewith, ready mixed processing powders are the simplest and most effective. Superior Cine-Chems are complete and contain all the necessary chemicals for complete reversal including a 1-Solution Bleach which eliminates the need to add Sulphuric Acid. Only water is needed. All of the chemicals with the exception of the Bleach have excellent keeping qualities and will develop five to six one hundred foot rolls of film if properly stored. When regular Bleach is used be sure to pour the Sulphuric Acid into the water while stirring with a glass rod. *Do Not Pour the water into the Sulphuric Acid.*





## FORMULAE

For those wishing to mix their own chemicals the following formulae are given. Weights should be carefully checked and the chemicals must be thoroughly mixed to insure proper distribution of all the chemicals.

(Superior Ready Mixed CineChems are prepared according to the formulae used in our own processing laboratory. These chemicals are scientifically mixed to give complete satisfaction.)

### FIRST DEVELOPER

The first development is given in the following solution. Dissolve in the order given.

#### ½ Gallon Solution

Water (125 degrees F.)	32 oz.
Metol	30 grains
Hydroquinone	234 grains
Sodium Sulfite, dessicated	3 oz. 137 grains
Sodium Carbonate, dessicated	2 oz. 150 grains
Potassium Bromide	150 grains
Potassium Thyocyanate	264 grains
Add cold water to make 64 ounces.	

Errors of exposure may be corrected to a considerable degree in the first developer by varying the developing time. Here experience in practicing with short strips will indicate just how the varying of the developing time effects the exposure.

While a green safelight may be used in the darkroom when developing panchromatic film, the film should be at all times protected from its direct rays.

After the film has had its first development and has been in the Bleach bath for about three minutes a small white light may be turned on in the darkroom and the succeeding steps may be carried out in the white light.

### 2nd Developer — ½ Gallon Solution

Water (125 degrees F.)	32 oz.
Metol	60 grains
Hydroquinone	270 grains
Sodium Sulfite	5 oz.
Sodium Carbonate, dessicated	3 oz. 167 grains
Add cold water to make 64 oz.	

Dissolve all the chemicals in the order given and re-develop for 5 to 7 minutes at 65 degrees.

### OTHER SUGGESTED FORMULAE

#### FIRST DEVELOPER

Water 125° F.	32 oz.
Metol	90 gr.
Hydroquinone	350 gr.
Sodium Sulphite, Anhydrous	3 oz.
Sodium Carbonate, Anhydrous	4½ oz.
Potassium Bromide	54 gr.
Water to Make	65 oz.

This will make a half gallon of STOCK SOLUTION which you may use for both your first and second developers in the following dilutions.

#### 1st Developer

1 part of stock solution      1 part water

#### 2nd Developer

1 part of stock solution      3 parts water

### BLEACH BATH

The Bleach Bath is made up as follows:

#### ½ Gallon Solution

Water	32 oz.
Potassium Bichromate	150 grains
Sulphuric Acid, C.P.	1¼ fluid oz.
Add Cold Water to make	
64 oz.	

When preparing the solution, always add the Sulphuric Acid to the water slowly while stirring, never add the water to the Acid as this may cause a violent reaction and spatter acid over the hands and face causing serious burns.



## CLEARING BATH

The Clearing Bath is made up as follows:

### $\frac{1}{2}$ Gallon Solution

Sodium Sulphite . . . 2 oz.      Water .64 oz.  
or

Sodium Bisulphite . . . . .1 oz. 290 grains  
Water . . . . .64 oz.

This solution may be used over and over again. To strain the solution, pour through wide mouth funnel into which cotton has been loosely stuffed.

## CHEMICAL FLASH AND REVERSAL BATH

For those preferring to flash their film by means of chemicals the following formula is recommended:

### $\frac{1}{2}$ Gallon Solution

Water . . . . .32 ounces  
Sodium Hydrosulfite . . . . .290 grains  
Sodium Bisulfite . . . . .400 grains  
Add cold water to make 64 ounces.

Dissolve chemicals in the order given. Complete reversal should be effected in from one to five minutes with the temperature between 65 and 70 degrees. During this operation, the film surface becomes completely black. If at the end of five minutes the film does not appear thoroughly blackened allow the film to remain in the solution as long as necessary. This formula should be prepared freshly before using, its keeping qualities being extremely limited. It should be discarded after being used. When using this formula for flashing it is not necessary to put the film through the second developer.

## FIXING HARD HARDENING BATH

Hypo . . . . .16 oz.  
Water . . . . .64 oz.  
When dissolved, add the following solution, separately prepared:  
Water . . . . .5 oz.  
Sodium Sulphite, Anhydrous . . . . .1 oz.

Acetic Acid, 28% . . . . .3 oz.  
Potassium Alum . . . . .1 oz.  
Be sure each chemical is thoroughly dissolved before adding the next.

## TITLE DEVELOPMENT

Use a high contrast developer when developing titles. Superior Hi-Contrast Title Developer is prepared specifically for this purpose. This is a high contrast negative developer for title film. The reversal process is not necessary for this step. Most titles are made by photographing black letters on a white background so that when the titles are given a negative development the titles appear white on a black background. This prevents halation on the titles and makes the reading of the title much easier. Another method for making titles is suggested. On many occasions the movie maker has a few feet of film left on the roll of film which he is going to process by the normal reversal process. In that case the approved procedure is to photograph the titles in the same method as explained above. However, after the film is reversed the titles which are black on a white background may be treated with any color of Fototint (see price list) which changes the background from the glaring white to a softly tinted shade. These titles may be used for titling Kodachrome pictures as well. The following formula is suitable for developing titles:

### Developer

Water (125 degrees F.) . . . . .32 oz.  
Metol . . . . .64 grains  
Hydroquinone . . . . .256 grains  
Sodium Sulfite, dessicated .6 oz. 180 grains  
Sodium Carbonate,  
dessicated . . . . .3 oz. 90 grains  
Potassium Bromide . . . . .150 grains



Add cold water to make 64 ounces.

Dissolve chemicals in the order given. The keeping qualities of this solution is good and may be used until exhausted.

### Fixer and Hardener

Water (125 degrees F.) ..... 32 oz.  
Sodium Thiosulfate (Hypo) ..... 16 oz.  
Sodium Sulfite, dessicated ..... 145 grains  
Acetic Acid, glacial ..... 1/2 oz.  
Boric Acid crystals ..... 145 grains  
Potassium Alum ..... 375 grains

Add cold water to make half gallon.

Dissolve the chemicals in the order given. The keeping qualities of this solution is good and it may be used until exhausted.

### TIPS ON THE USE OF THE MORSE G-3 DAYLIGHT LOADING DEVELOPING TANK

Formulae are given in the Booklet of Instructions accompanying the Morse Tank but for the amateur who does not wish to mix his own chemicals Superior Cine Chems are available. These prepared processing powders are designed for use with the Morse Tank. The development, however, must be carried out using the instructions accompanying the Morse Tank. Due to the type of development employed, longer developing times are necessary when using the Morse Tank than when using the Superior Cine Reel.

When developing Superior Cine Films the following times are recommended:

	25 Ft.	50 Ft.	100 Ft.
Plus and Regular.....	6min.	8min.	11min.
Superpanex #24 and #64..	8min.	10min.	15min.
Superpanex #100 .....	12min.	15min.	23min.

In order to insure proper development the addition to a few drops of KWIK WET helps materially as it permits the film to continue development even

while it is rolled up, thus insuring a more even development.

The use of superior Chemical Flash is suggested in place of (flashing with a photoflood light following a second development). When using the Chemical Flash heating of the solution from the light is eliminated and complete flashing is assured.

In order to avoid the necessity of chamoising or sponging the film before placing it on the drying rack, it is recommended that the film be immersed for five minutes (after complete washing) in a bath of water to which 15 drops of KWIK WET has been added. This will insure fast and even drying without air-bubbles or water spots.

**WATCH TEMPERATURE**—never allow the solutions to get warmer than 70 degrees. Keep Morse Tank in Tray of tempered 65 degree water to insure proper temperature.

**WINDOW MAY BE OPENED** to watch development of film after bleaching a few minutes—the remainder of the operation can be carefully followed thru the window at the front of the tank.

**CHECK YOUR WASH WATER** keep it constant with your chemicals — extreme changes in temperature will cause grainy films when projected.

**TEST YOUR FILM FOR EXPOSURE** if your film is underexposed it will require longer developing time — if overexposed shorter time.

Should your film appear to be negative after the entire reversal process has been completed your failure lies in the bleach solution. Either your film was not bleached long enough or your bleach bath has deteriorated to a point where it no longer has any chemical potency.



## SUPERIOR CINE CHEMS

Superior Cine Chems will process all types of Reversal films including Eastman Kodak Super X and Super XX professional blue base reversal film.

In reversal processing the entire control lies in the first developer. Over development produces an effect similar to over exposure and under development fogs highlights and generally is like under exposure. Time and temperature are extremely important. Check both carefully.

## QUESTIONS AND ANSWERS

*What causes film to have a "snowy appearance" when projected?*

A "snowy appearance" is due to dust or reticulation of the film. When film dries in a dusty room and dust accumulates on the wet film, a "snowy" effect will be apparent upon projection. If film is washed at a higher or lower temperature than the developing solution, the contraction and expansion of the film will result in a minute breaking of the emulsion and upon projection the film will appear to have a "snowy" effect.

*What causes the emulsion to "run"?*

Too high temperatures will cause the emulsion to run. The images will appear wavy and irregular upon projection.

*What causes film to be too dark when projected?*

Film that is underexposed is black and dense and will appear dark when projected. Be sure to allow

full development if you know the film may be underexposed. Weak solutions or solutions less than 65 degrees may result in a heavy, dark roll. Be sure the projection lamp is the correct wattage. Many times properly exposed and developed film will give poor projection due to a small wattage projection bulb.

*What causes film to be thin and too light?*

Overexposed film is too light and appears to be thin and transparent. Allow less time in the first development if the film is known to be overexposed. Developing solutions which are too warm may also result in a light image.

*Can I use a small colored Christmas tree light for a safelight?*

No. This is one of the common causes of fogged films. Only a photographic safelight can be used when working with film. These safelights are made of colored glass. Christmas tree lights are made of white glass which has been coated with color and has tiny pin holes through which the white light seeps and fogs the film. Safelights used too close to the film may also cause fogging.

*What causes brownish tinge?*

Old or improperly mixed bleach or not sufficient time in the Clearing Bath will cause a brownish tinge. Insufficient wash after first developer may cause a brown stain.

*What causes clear spaces every few inches?*

Film wound emulsion side down on the reel. The glossy side of film must be toward the rack.



*What causes uneven all over light and dark sections?*

Insufficient light or time in flashing or shadows thrown on parts of the film while flashing will result in uneven light and dark sections.

*What causes small light circles on film?*

Usually water spots cause small circles on film when projected. Water droplets should be removed carefully with chamois or viscose sponge before drying.

*What causes marks and uneven clear spots on film?*

Emulsion coming in contact with hands, fingers or other objects while wet. Emulsion is soft and easily damaged while wet. Handle film as little as possible and always by the edge.

*How can I develop film into sepia for titles?*

After clearing film re-develop directly into  
Sodium Sulfide (NOT SULFITE) . . 1 oz. 145 grains  
Water . . . . .  $\frac{1}{2}$  gal.

Use at 65-70° for 5 minutes. Flashing is not necessary nor is second development. Wash and fix as usual. This action will give a sepia tone to the film.



